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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/786,738

02/25/2004

David John DiGiovanni

72-14-2-4-2

3005

7590

03/24/2005

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EXAMINER

HUGHES, JAMES P

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/786,738

Applicant(s)

DIGIOVANNI ET AL.

Examiner

James P. Hughes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 5-14 are cancelled per applicants' preliminary amendment of February 25, 2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geertman (5,897,680). Geertman (5,897,680), herein after referred to as "Geertman", teaches a low PMD (polarization mode dispersion) optical fiber (which may be single or multi-mode) that comprises at least three twists per meter alternating in clockwise / counterclockwise rotations. (See e.g., Col. 5, ll. 25 – Col. 6, ll. 65)

Regarding claim 3; Geertman teaches the greater the number of turns per meter the lower the PMD and that at least three turns per meter are desirable. (See e.g., Col. 4, ll. 25-55) Following, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ at least 4 turns per meter in the fiber of Geertman, based on the design requirements of a system to reduce the PMD – which Geertman teaches as advantageous (See, Col. 3, ll. 1-3).

Regarding claim 4; It is respectfully submitted that it is well known in the art – and taught by Geertman (See e.g., Col. 1, ll. 20-25) – that PMD is partially created by the non-

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circularity of the optical fiber core. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ an optical fiber core that is as close to a perfect circle as possible – i.e., 0% ovality – because this would yield lower PMD which Geertman teaches as advantageous (See, Col. 3, ll. 1-3).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hart Jr. et al. (5,298,047), herein after referred to as “Hart”, teaches a low polarization mode dispersion optical fiber comprising with a twist impressed on the core that alternates between clockwise and counterclockwise twists. (See Col. 4, ll. 60-66) Following, Hart teaches that for optimal operation a spatial twist frequency of at least 4 spins / meter is desirable (See Col. 2, ll. 60-63 and Col. 5, ll. 30-40 and Fig. 6). Additionally Hart discloses as previously knowledge that PMD is partially caused by non-circular cores. (Col. 1, ll. 20-25) Thus, a core as close to circular as possible – i.e., an ovality of 0% – is desired.

Onishi et al. (5,581,647) teaches a PMD compensation fiber wherein it is taught that PMD decreases as the number of turns per meter increase and that as ovality decreases, PMD decreases with a preferable ovality of less than 1%. (See e.g., Col. 2, ll. 5-50 and Figs. 7a-7c) Onishi et al. (6,076,376 and 6,347,537) teaches a method of making an optical fiber having an imparted twist. Henderson et al. (6,240,748) teaches an optical fiber with reduced PMD. Garner et al. (6,859,596) teaches an optical fiber with ultra-low PMD. Blaszyk et al. (6,550,283) teaches an optical fiber with controlled twisting. Evans et al. (5,704,960) teaches an optical fiber with a reduced PMD. Galarza (6,658,896) teaches a fiber optic light guide. Kato et al. (5,721,800)

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teaches a dispersion-shifted fiber. Galtarossa et al. (2004/0022507) teaches an optical fiber with reduced PMD.

DiGiovanni et al. (6,422,043), teaches a multimode optical fiber having an essentially non-circular core with a twist alternating between clockwise and counter clockwise configurations impressed on the core. (See e.g., Col. 6, ll. 60 – Col. 7, ll. 20) DiGiovanni et al. (6,542,679) is similar to DiGiovanni et al. (6,422,043).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James P. Hughes whose telephone number is 571-272-2474. The examiner can normally be reached on Monday - Friday 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James P. Hughes
Patent Examiner
Art Unit 2883



Frank G. Font
Supervisory Patent Examiner
Technology Center 2800